

## MEASURING THE FRACTURE ENERGY OF WC GRAIN BOUNDARIES

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Cemented carbide (WC-Co) is a composite with tungsten carbide particles embedded in a cobalt matrix<sup>1</sup>. Applications in mining, drilling and metal cutting industries makes use of WC-Co composed materials owing to its high hardness and wear resistance<sup>2,3</sup>. WC-Co tools undergo wear and fracture over their lifetime leading to degradation in performance and eventual failure. Hence, it is beneficial to build up knowledge of wear and fracture of WC-Co. This work is aimed at exploring the fracture component.

The objective of the study is to investigate the fracture energy of different interfaces within the structure. This will be achieved through performing double cantilever beam (DCB) tests at carbide grain boundaries of interest and results will be compared with DFT calculations.

Electron backscattered diffraction (EBSD) has been employed to choose single grains or boundaries of interest. MTEX has been employed to process the EBSD data and allow boundaries that are of the correct type and perpendicular to the surface to be chosen. Finally, DCBs have been fabricated within regions of interest and tests have been performed to study interface properties.

### References

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